WSD General Order No. KCY-5300 & KCY-5301 Item No. 1-4

RATE OF TEMPERATURE CHANGE:

AN UPSET TEMPERATURE OF 670 dg F IS PERMITTED PROVIDED THE DURATION DOES NOT EXCEED 30 MINUTES PER EXCURSION OF 200 HOURS IN THE TOTAL LIFE OF THE FAN. BASED ON THIS, THE RATE OF TEMPERATURE CHANGE IS NOT RESTRICTED PROVIDING THE VIBRATION LEVELS ARE NONITORED AND ALLOWABLE LEVELS ADHERED TO AS SPECIFIED ON FOUNDATION DESIGN CRITERIA DWG. 2429D95.

3. CONTRACT PERFORMANCE

FAN LOAD	VOLUME CFM	STATIC PRESSURE TP INLET	STATIC PRESSURE TP OUTLET	STATIC PRESSURE FSP RISE	TEMP °F	SPEED RPM	BHP	DENSITY #/FT.^{3}
TB	1,128,400	-30.5	7.84	38.34	300	954	7415	.0409
NET	992,665	-21.1	5.2	26.30	300	809	4596	.0409
100	933,578	-19.2	4.6	23.80	300	768	3918	.0409
75	754,686	-13.7	2.7	16.40	300	636	2195	.0409
50	555,420	-8.8	2.3	11.10	300	514	1106	.0409
25	324,776	-4.5	0.8	5.30	300	353	325	.0409

Performance based on elevation of _____ feet, 25.20 " Hg Bar. Pressure

Performance based on use of Evase expanded to ____ sq. ft.

4. NOISE LEVELS

BAND Center Frequency	H_Z	1 63	2 125	3 250	4 500	5 1000	6 2000	7 4000	8 8000	Overall
Measured at	A	--	--	--	--	--	--	--	--	--
**	B	127	120	120	115	114	113	110	105	120
*	C	118	111	108	102	100	98	90	80	120
**	D							OVERALL		93

A - Inlet noise, measured _____ feet from inlet
B - Discharge Noise, measured 5 feet from discharge
C - Noise thru housing, measured 5 feet from housing, without inlet noise added
D - Noise around fan, measured 5 feet from housing with inlet noise added, BUT WITHOUT discharge, drive or noise effect of other equipment added.

Above noise levels are:

* ☒ Sound power Ref. 10^{-12} Watts (metric)
** ☒ Sound pressure Ref. .0002 microbars
** ☒ A scale ☐ C scale

January 1978

IP7_039125

WSD General Order No. KCY-5300/01/02/03 Item No. 1,2,3,4

Comments: _____

5. WHEEL GAUGES/MATERIALS

Hubs: FABRICATED STL. CYLINDER ASTM A36 FLANGE ASTM A441

Center/Backplate: 1.75 " Thick; ASTM A514 GR E

Blades:

Single Thickness:

Blades: _____ " Thick; _____

Blade Liner: _____ " Thick; _____

Reinforcing Rings; _____ " Thick; _____

Corner Pads; _____ " Thick; _____

Airfoil:

Skins: .25 " Thick; ASTM A514 GRA

Ribs: .25 " Thick; ASTM A514 GRA

Nose: 1.94 DIA " ~~Thick~~; ASTM A514 GRE

Liner: .25 " Thick; ASTM A514 GRA

Side Plates: .75 " Thick; ASTM A514 GRA

When Field Balancing of Rotor is necessary follow procedures outlined in Section 16.2 - Field Balancing of Heavy Duty Fan Wheels. Use Category III for welding weights to wheel.

6. BEARINGS: Size 12 " Dia; Type (W) HD SLEEVE

COOLING MEDIUM:

☐ Water: _____ GPM Max; _____ GPM Min.
Water Temperature; _____ °F Max; _____ °F Min.
Water Pressure; _____ PSI Max; _____ PSI Min.

WSD General Order No. KCY-5300/01/02/03 Item No. 1,2,3,4

☐ Air: _____ CFM at _____ "H_2O Static Pressure

Air Temperature; _____ of Max; _____ of Min.

☐ Non-Cooled (Ambient Air)

☒ External Lubricator

LUBRICANT

☐ Grease: Type _____

☒ Oil: Viscosity 300 SSU at 100 °F
(See Section 6 for complete Oil description)

Quantity: _____ Qts. per Bearing - Self Contained

12 GPM Max.; 8 GPM Min. per Bearing - Flood Lubricated

LUBRICATING METHOD

☐ Ring - Self Contained

☐ Disc - Self Contained

☒ Flood Lubricated - From External Lubricator

BEARING OPERATING TEMPERATURE

Babbitt: Per Tip Sensitive Thermocouple or Resistance Temperature Detector

140 °F to 160 °F Normal Operating Range

180 °F Alarm

200 °F Shutdown

Oil temperature for Start-up is 50°F for Self-contained Bearings; 90°F for Flood Lubricated Bearings.

7. LUBRICATOR: Nominal Size (Tank Capacity) 150 Gallons

HEAT EXCHANGER	CIRCUIT
☐ Water-to-Oil	☐ Single
☒ Air-to-Oil	☒ Dual

WSD General Order No. KCY-5300/01/02/03 Item No. 1, 2, 3, 4

Electrical Requirements:

Pump Motors: 5 HP, 1800 RPM

3 Phase, 60 HZ, 230/460 Volts

Reservoir Heater: 9.25 KW, 3 Phase 60 HZ 480 Volts

Air Cooled Heat Exchanger Fan Motor: 1.5 HP 1200 RPM,

3 Phase, 60 HZ, 230/460 Volts

8. TURNING GEAR

Turning Gear Assembly designed to:

☐ Start fan from Rest

☐ Engage during coast down ONLY and maintain specified RPM.

Motor: _____ HP, _____ RPM

3 Phase, _____ H_Z, _____ Volts

Gear: Output RPM _____ (Input to Fan)

Motor-Gear Designed for:

Fan Rotor: Weight _____ Lbs., WR^2 _____ $Lbs/Ft.^2$

Drive Rotor: Weight _____ Lbs., WR^2 _____ $Lbs/Ft.^2$

Bearing; Dia. _____"; Sleeve Length _____"

WSD General Order No. KCY-5300 & KCY-5301 Item No. 1-4

9. DRIVE

Main Drive: ☐ Motor_____HP_____RPM

3 Phase, _____ H_Z_____Volts

☐ Single Speed; ☐ Two-Speed; ☐ Variable Speed

☐ Turbine_____HP_____RPM at Test Block

_____RPM Maximum Overspeed

Overspeed: Continuous ☐

Momentary ☐

Secondary Drive: ☐ Motor_____HP,_____RPM

3 Phase,_____ H_Z _____Volts

☐ Turbine_____HP,_____RPM at Design

_____RPM at Max. Overspeed

Overspeed: Continuous ☐

Momentary ☐

Variable Speed Drive: Type:_____
(Fluid Drive, Magnetic Coupling, etc)

Make:_____

Model:_____HP_____

RPM - Min._____Max._____

10. VIBRATION AMPLITUDES

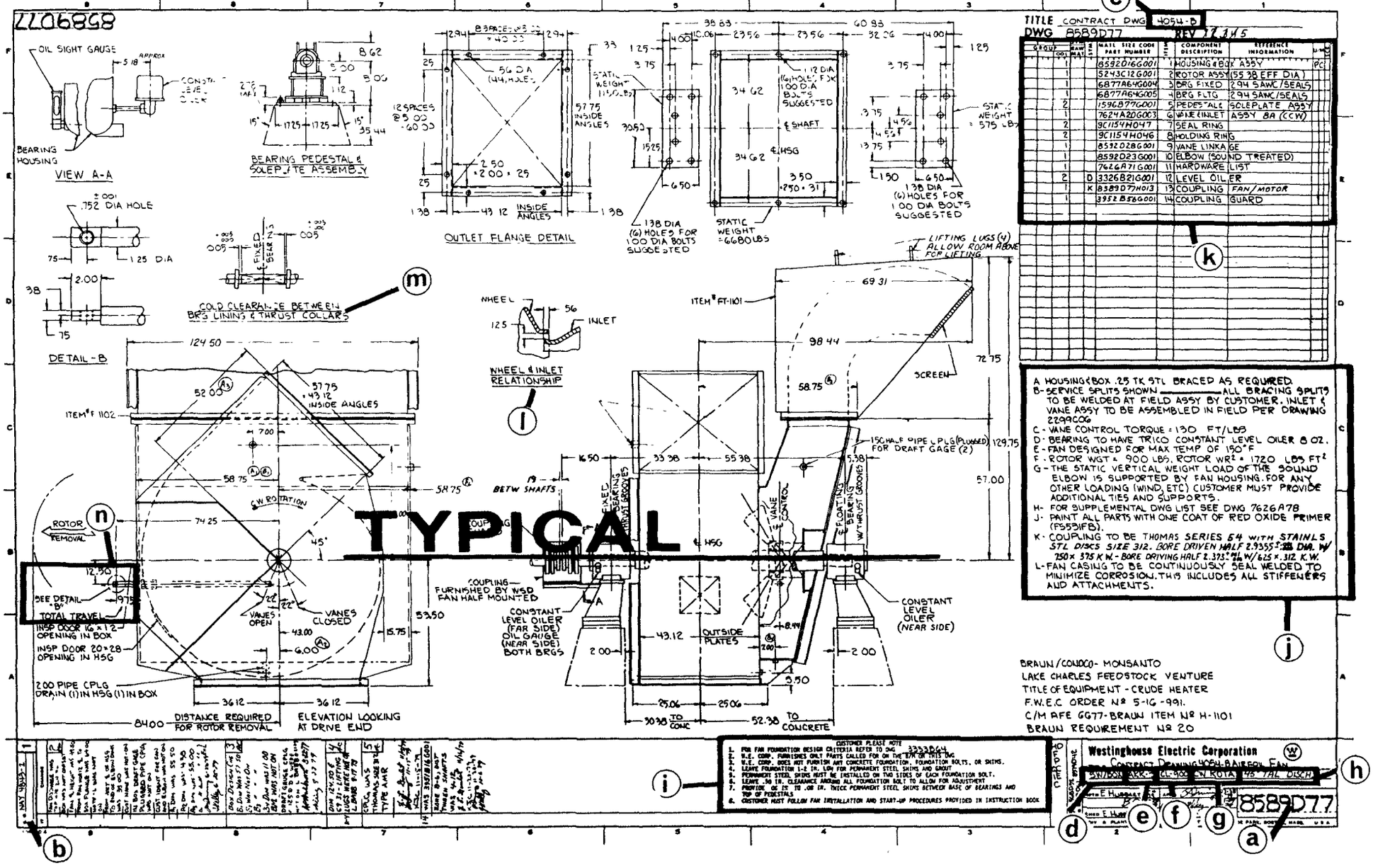
The following table indicates the normal and allowable horizontal and vertical vibration levels of our products. Also shown are levels at which corrective action is required. All values shown are in mils; peak-to-peak amplitude as measured on the bearing housing, horizontal centerline with a seismic measuring device.

WSD General Order No. KCY-5300/01/02/03 Item No. 1,2,3,4

Operating Speed RPM	Peak-to-Peak Amplitude - Horizontal and Vertical - Mils		
	Normal	Rough Alarm	Correction Required Shutdown
1800	0 to 2.0	3.5	5.0
1500	0 to 2.0	4.0	5.5
1200	0 to 2.5	4.5	7.0
1000	0 to 3.0	5.5	7.5
900	0 to 3.0	6.0	8.5
750	0 to 3.5	7.0	9.5
720	0 to 3.5	7.0	9.5
600	0 to 4.5	8.0	11.0
514	0 to 5.0	8.5	12.5
NOTE: For allowable Axial vibration levels, use one-half of above values.			

11. SUPPLEMENTAL DRAWINGS

DRAWING NO.	DESCRIPTION	SECTION
2090F87	CONTRACT DWG	5
7644A41	HARDWARE LIST	5
2433D04	OUTLET DAMPER SEAL AIR FAN	5
5453C50	BRACING ROD	5
5454C88	CASING CUT FOR ROTOR REMOVABLE	5
7644A48	THERMOCOUPLE	6
5910C29	BEARING ACCESSORIES	7



GROUP	QTY	RAW MAT'L	MATL SIZE CODE PART NUMBER	ITEM	COMPONENT DESCRIPTION	REFERENCE INFORMATION	WT.
	1		8592D166G001	1	HOUSING & BOX ASSY		PC
	1		5243C12G001	2	ROTOR ASSY	(55.38 EFF DIA.)	
	1		6877A64G004	3	BRG FIXED	2.94 SAWC/SEALS	
	1		6877A64G005	4	BRG FLTG	2.94 SAWC/SEALS	
	2		1596B77G001	5	PEDESTALE	SOLEPLATE ASSY	
	1		7624A20G003	6	VANE/INLET	ASSY 8A (CCW)	
	2		9C1154H047	7	SEAL RING		
	2		9C1154H046	8	HOLDING RING		
	1		8532D28G001	9	VANE LINKAGE		
	1		8592D23G001	10	ELBOW (SOUND TREATED)		
	1		7626A71G001	11	HARDWARE LIST		
	2	D	3326B21G001	12	LEVEL OILER		
	1	K	8589D77H013	13	COUPLING	FAN/MOTOR	
	1		3952B56G001	14	COUPLING	GUARD	

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Section 5.3 Identification of Parts

The Contract Drawing shows Pictorially, by Bill of Material Legend or notes, the fan with all features and accessories included in the contract. In general, fan components are shipped separately, and Housing and Inlet Box assemblies are shipped in several pieces. Therefore Field Identification of the components and pieces for a specific fan can be complicated. Refer to Figure 5.3-1 for the basic fan and components and their relative positions. The following paragraphs indicate the ways that components and pieces have been marked at the factory for simplified Field Identification.

Additional care must be exercised in identifying components and pieces on orders with multiple units of

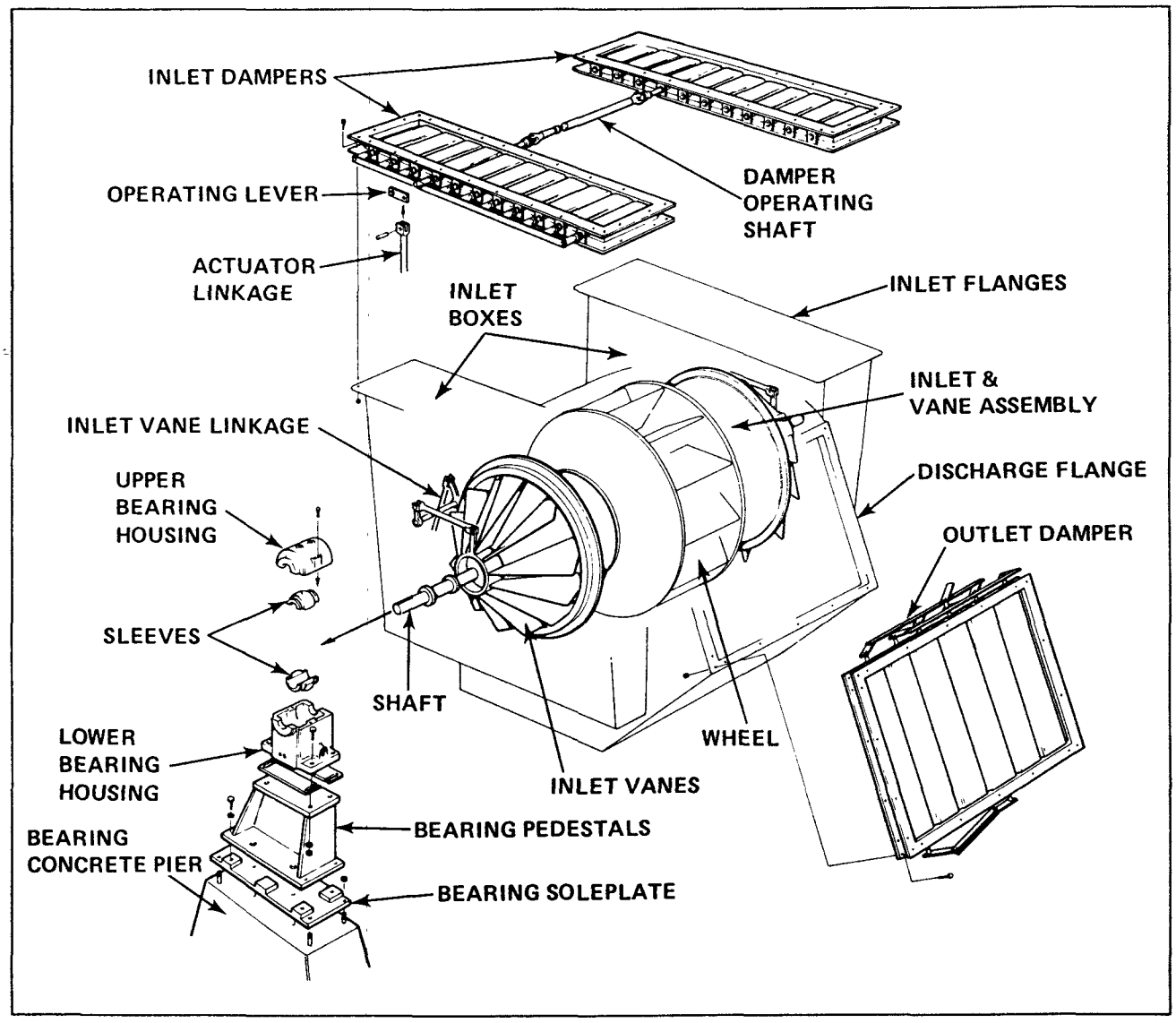


Fig. 5.3-1 *Fan Components and Accessories*

Effective October

Westinghouse Electric Corporation
Sturtevant Division
Hyde Park, Boston, MA 02136

S. Check complete Housing/Inlet Box alignment in relation to Rotor and all center lines. Verify that Side Sheets are vertical. Correct as required.

2. INLET INSTALLATION AND ALIGNMENT

NOTE

- Rotor must be leveled and aligned to Drive Train Centerline and at proper elevation.
- Inlets must be aligned to Wheel as shown in the Wheel and Inlet Relationship detail on Contract/Main Assembly Drawing. See Figure 5.5.3-14 for typical Wheel and Inlet relationship details. Figure 5.5.3-13 shows the Rotor and Housing/Inlet Box in cross section.
- The Wheel-to-Inlet relationship detail on Contract Drawing will show the cold or ambient temperature setting. Fans for elevated temperature applications will have a clearance at the top of Wheel greater than at the bottom in the cold condition. The Wheel and Inlet will come into alignment at operating temperature.
- Vane and Inlet Assemblies must be positioned with the Operating Lever and Ring Assembly in the position Indicated on Contract/Main Assembly Drawing.
- Final axial adjustment on Series 2300 and 2400 Fans must be made by loosening machine screws holding the Sliding Seal Ring to the Fabricated Steel Inlet, and sliding the Seal Ring to the correct position. Tighten all machine screws securely after alignment.

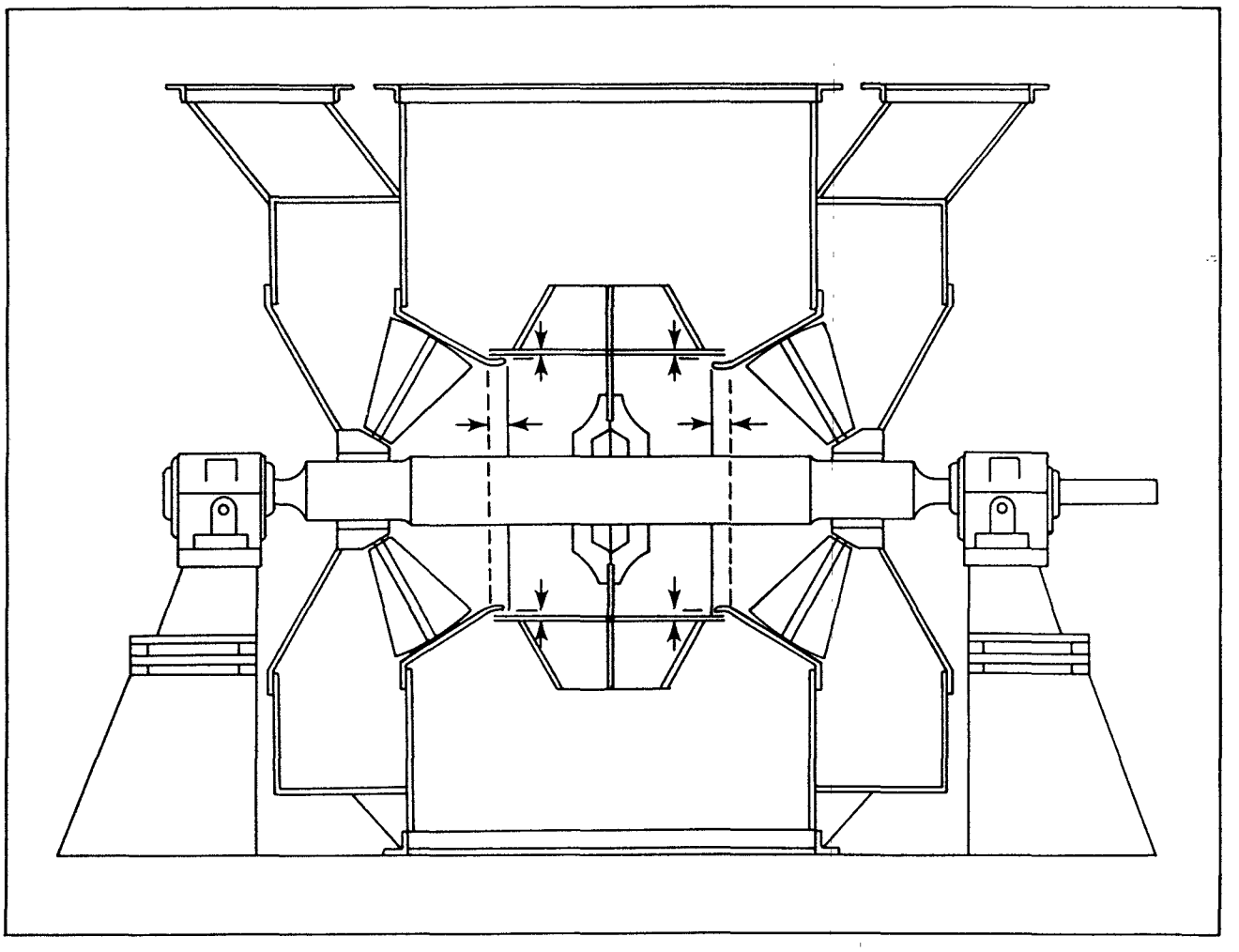


Fig. 5.5.4-13 *Typical Cross Sectional View of Fan*

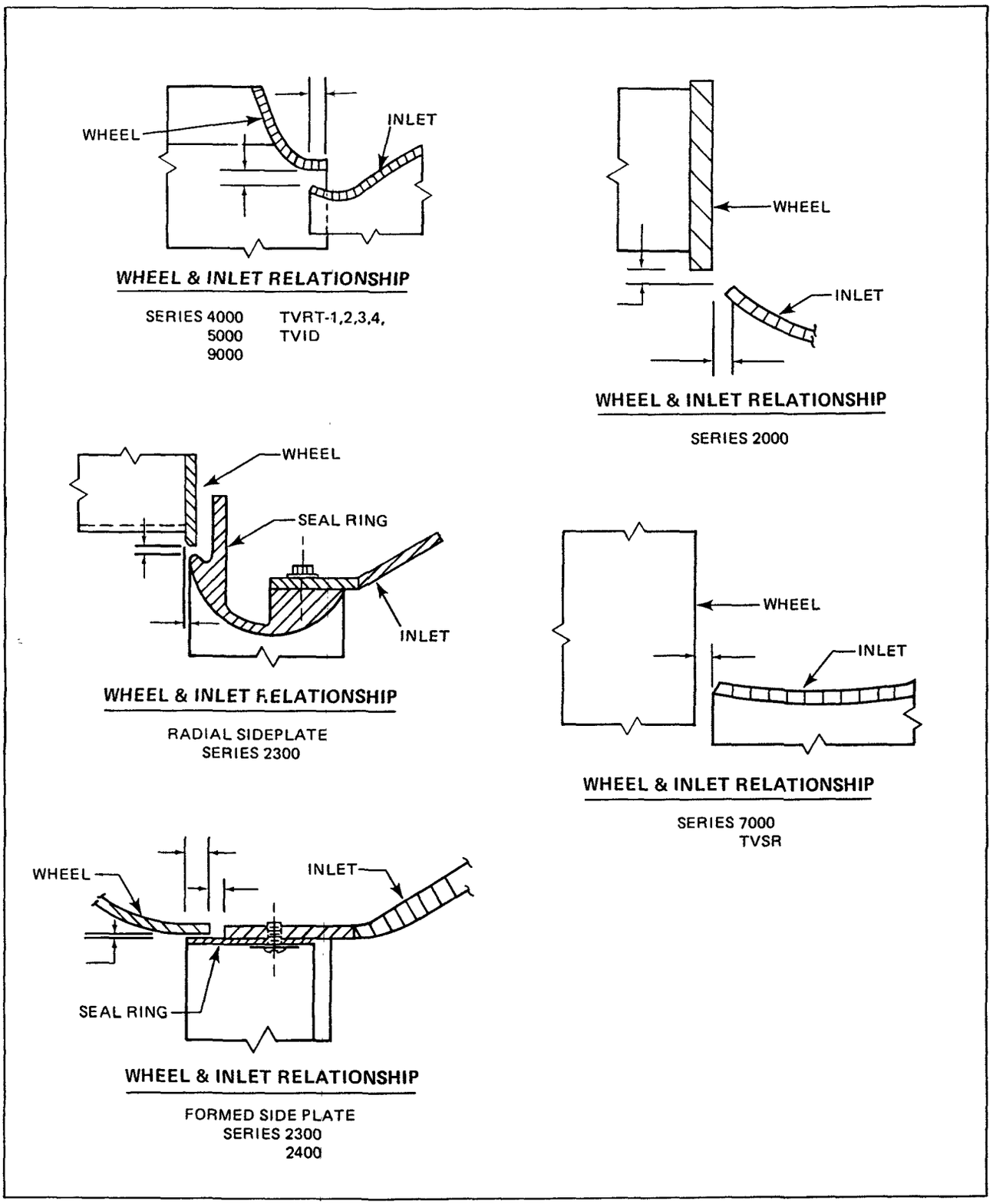


Fig. 5.5.4-14 *Typical Wheel-Inlet Relationship Details*

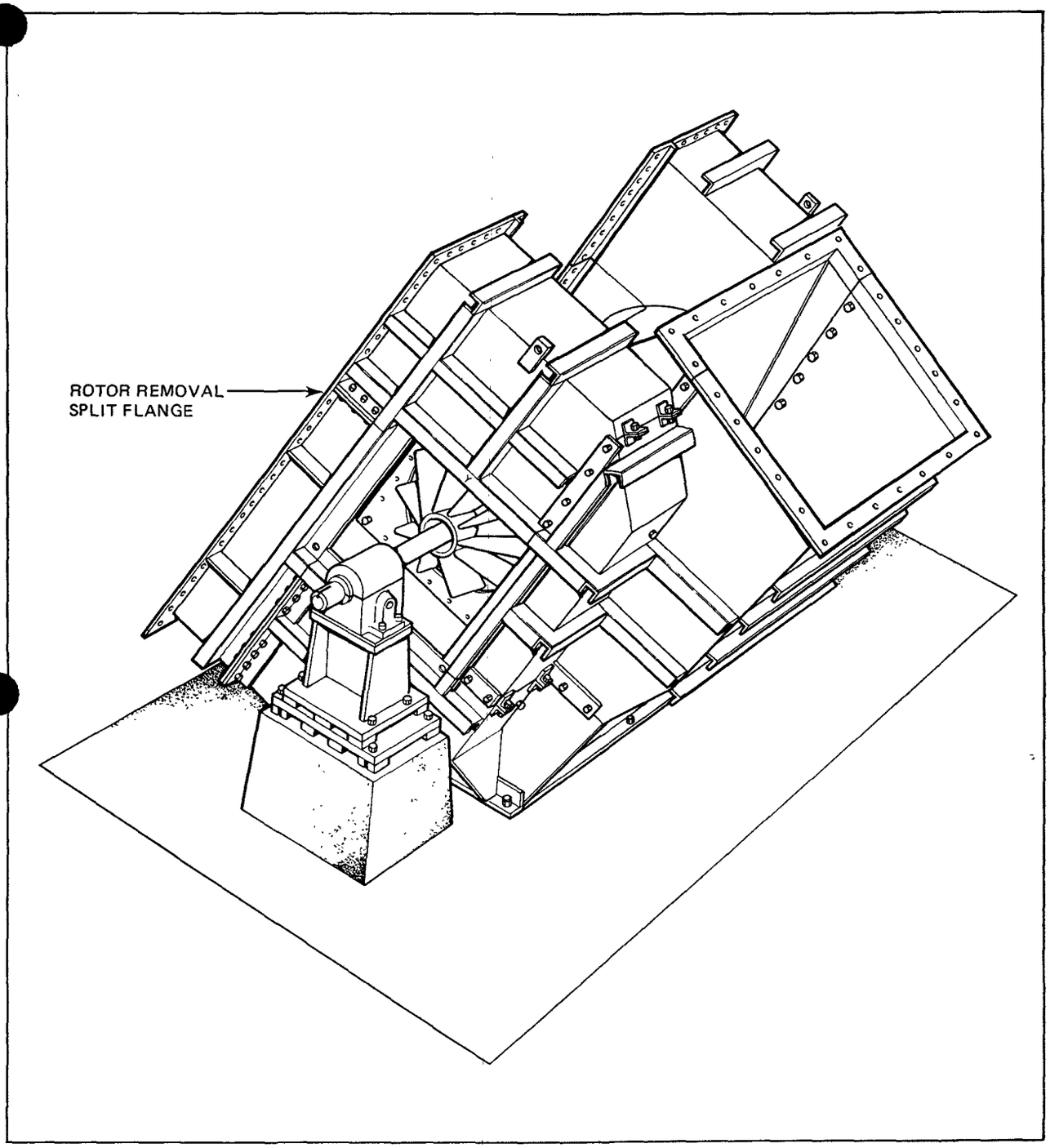


Fig. 5.5.4-11 *Housing Construction - Type 4 Tenth Erection Stage*

N. Place gasket material (if required) on Rotor Removal Split Flanges, and tie or tape temporarily. Lift Rotor Removal section in position. Use drift pins to align bolt holes in the mating angle iron flanges.

O. If sections do not line up, check assembly for misaligned sections installed previously. The Housing/Box sections were factory-mated and match marked. If all sections are correctly aligned they will mate properly. Correct any misaligned sections.

P. Install and tighten all bolts and nuts in Rotor Removal Section Flanges. Refer to Torque Values in Section 5.10.

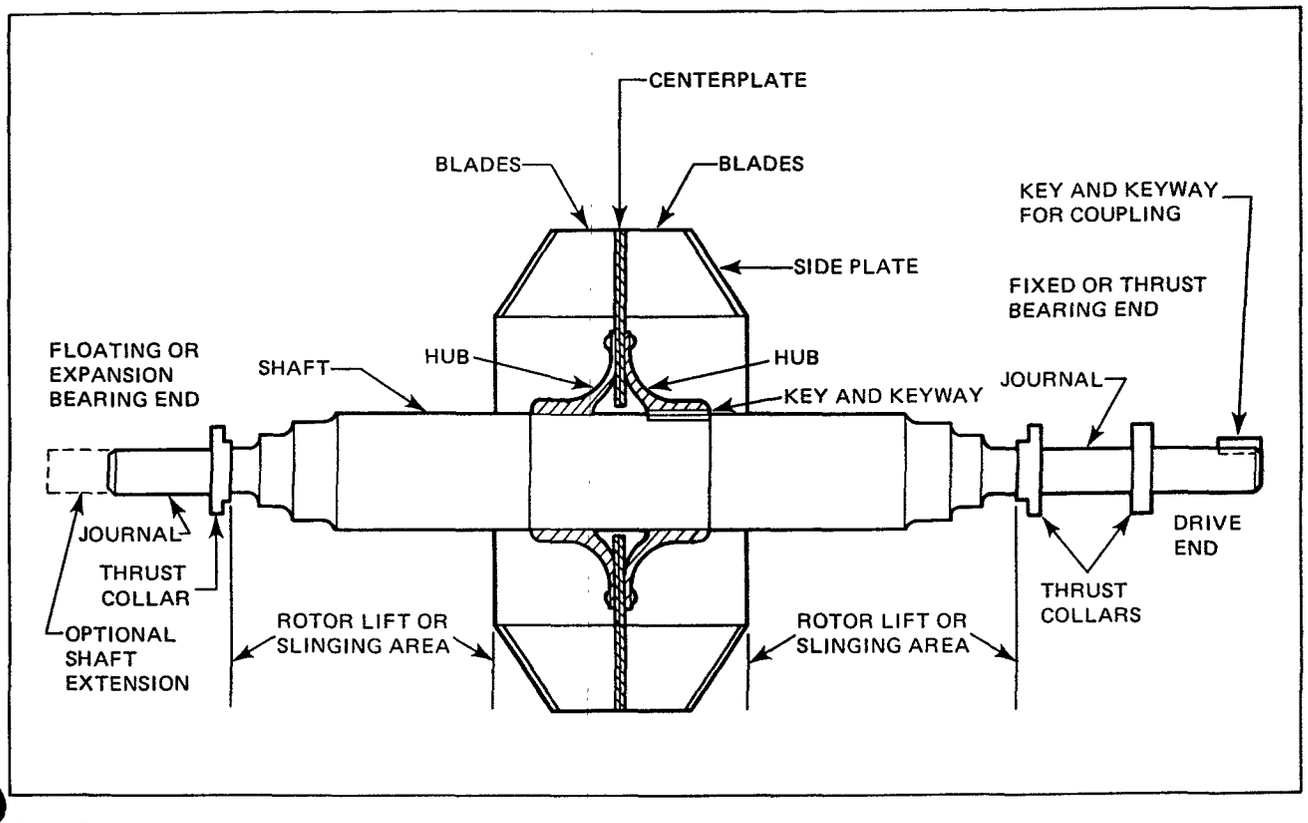


Fig. 5.7.1-2 *Typical Rotor Component Identification*

determined from the Main Drive end as specified by customer. See Figure 5.7.1-3 for Rotation and Wheel Blade Types.

6. Identify and move Fan Inlets or Vane and Inlet Assemblies to their respective Rotor ends.

- Inlets without Vanes are interchangeable and can be assembled to either side of Double Width-Double Inlet Fan.

- Vane and Inlet Assemblies are NON-interchangeable, and must be installed on the correct side of fan. Refer to Section 8 - Inlet Vane Controls, Preparation for Installation.

NOTE

Refer to Contract/Main Assembly Drawing for position of Vane Operating Lever. Vane Operating Lever must be in that approximate position when Vane and Inlet Assemblies are placed on Rotor.

7. Guide Inlets or Vane and Inlet Assemblies on Shaft. Place in approximate installation position; support securely to prevent damage to equipment or injury to personnel.

NOTE

Assure that all Non-Split Inlet Parts, such as Inlet Vane Control Seal Parts, are placed on Shaft in proper installation sequence.

8. Pressurized Air Shaft Seals Only

Refer to Contract/Main Assembly Drawing, if Pressurized Air Shaft Seal Assembly is listed in Bill of Material; refer to Section 11.3 for seal details. (If not listed, proceed to Step 9.)

Seal Bodies are to be placed on the Rotor in their respective position to their location on the fans.

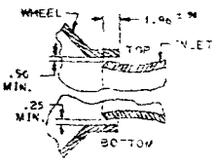
CAUTION

SEAL BODIES HAVE MACHINED SURFACES AND MUST BE HANDLED WITH CARE.

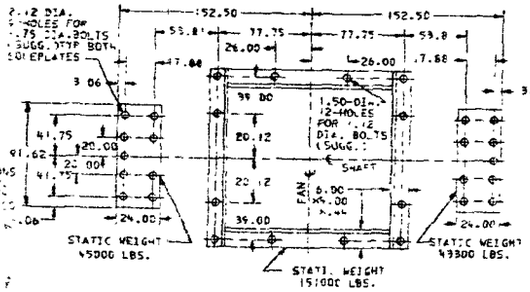
Insert a minimum of four (4) wooden wedges between machined Seal Body inside diameter and Shaft outside diameter and secure into position.

9. Install Bearings on Rotor. Refer to Section 6 - Bearings.

TITLE CONTRACT DWG. 4132 SPCL.
DWG. 2090F87 REV. [illegible]

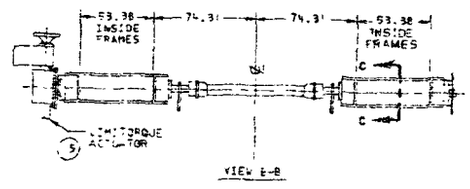


WHEEL & INLET RELATIONSHIP
FIXED BRG SIDE
COLD CLEARANCES ARE SHOWN & ARE TO BE HELD THROUGH 360° ROTATION OF WHEEL

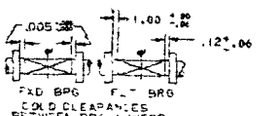


DIMENSIONS ARE TYP. FOR BOTH SOLEPLATES

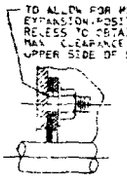
						209[illegible]F22600	1	HOUSING	W/BOXES	PC
						2429D97G001	2	ROTOR CW	95.66 EFF.DIA.	PC
						2429D97G002	3	ROTOR CCW	95.66 EFF.DIA.	PC
						52[illegible]C866034	4	BRG 12 HD	W/GRVS & TROUGH	PC
						52[illegible]C866033	5	BRG 12 HD	FF LUBE W/GRVS.	PC
4	4		4	4		2[illegible]C246017	6	BRG SEALS	BRONZE	PC
2	2		2	2		543[illegible]C066014	7	MTG PLATE	1/8 PROBE	PC
1	1					209[illegible]F1G001	8	LUBRICATOR	150 GL AIR/D.C.	PC
2	2		2	2		6 764[illegible]46G001	9	THERMOCPL.		PC
2	2		2	2		58 0C29600	10	BRG ACCESS		PC
2	2		2	2		52[illegible]C2 G002	11	PEDESTAL	W/SOLEPLATE	PC
2	2		2	2		2[illegible]C2 G002	12	INLET ASSY		PC
2	2		2	2		2[illegible]C36DF3600	13	RECESS		PC
			1			209[illegible]F29G001	14	DAMPER	INLET	PC
1						6 764[illegible]46G001	15	ACTUATOR	INLET DAMPER	PC
2	2		2	2		155[illegible]C99H095	16	SEAL RING		PC
2	2		2	2		155[illegible]C99H093	17	HOLD RING		PC
1	1		1	1		764[illegible]A6 G001	18	HARDWARE		PC
1	1		1	1		545[illegible]C65G001	19	OUTLET EXT		PC
						243[illegible]D95G00	20	SEAL AIR FAN OUT. DAMP.		PC
	1					495[illegible]B30H007	21	HEATER	SPARE FOR 1T-8	PC
	10					4[illegible]5B24H019	22	FILTER ELEM	SPARE FOR 1T-8	PC
						209[illegible]F26G001	25	DAMPER	INLET	PC



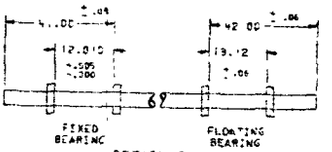
VIEW B-B



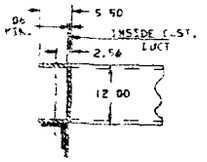
COLD CLEARANCES BETWEEN BRG LINERS & THRUST COLLARS



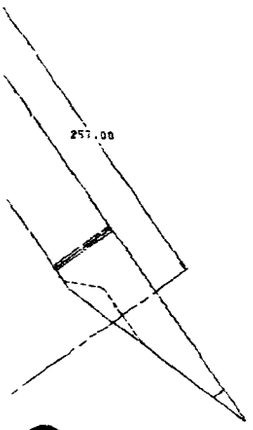
DETAIL D

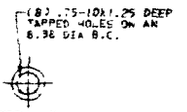


DETAIL G
THRUST COLLAR LOCATION
SEE 74-(A D FOR POSITIONING THRUST COLLARS TO CHANGE ROTATION

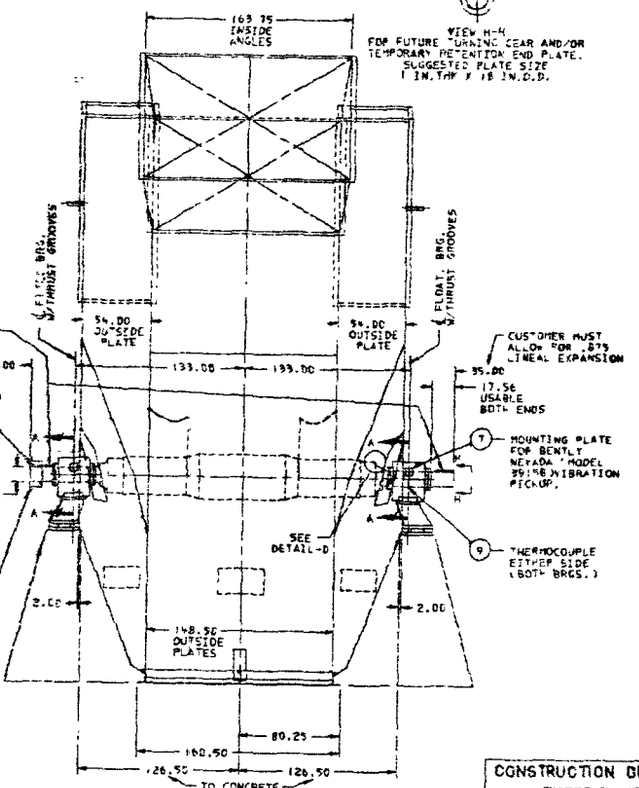


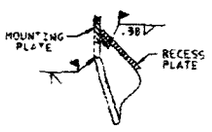
SECTION C-C





VIEW H-H





SECTION F-F

GROUND FLOOR ELEV. 4675'-10"

A-HOUSING & BOXES (ASTM A-441) .50 THK. W/.75 THK. SCROLL. BRACED AS REQUIRED.
SERVICE SPLITS SHOWN
ERECTION SPLITS SHOWN
FIELD ERECTION REQUIRES WELDING OF ALL BRACING SPLITS. ERECTION SPLITS INLET BOXES TO MSG. SIDE PLATES, BOX BRACING RODS, INLET DAMPER TO INLET BOX FLANGE & RECESS MOUNTING PLATE JOINT (SEE SECTION F-F).

B-G001/4G004-CW ROTA. FAN AS SHOWN - TAG NO. XCCE-FAN-1C & 1D. G002-G005-CCW ROTA. FAN TO HAVE FIXED BRG. W/SHAFT EXTENSION ON OPPOSITE SIDE OF FAN - TAG NO. XCCE-FAN-1A & 1B.

C-FAN DESIGNED FOR A MAXIMUM CONTINUOUS OPERATING (DESIGN) TEMPERATURE OF 360°F IN ADDITION, AN UPSET TEMPERATURE OF 670°F IS PERMITTED PROVIDED THE DURATION DOES NOT EXCEED 90 MINUTES PER EXCURSION OR 200 HOURS IN THE TOTAL LIFE OF THE FAN BASED ON THIS, THE RATE OF TEMPERATURE CHANGE IS NOT RESTRICTED PROVIDING THE VIBRATION LEVELS ARE MONITORED AND ALLOWABLE LEVELS ADHERED TO AS SPECIFIED ON FOUNDATION DESIGN CRITERIA DWG. 2429D95.

D-ROTOR WEIGHT = 73440 LBS. ROTOR WR² = 988240 LBS.FT.²

E-INLET DAMPER TORQUE = 4389 FT.LBS.

F-TOTAL WEIGHT OF FAN = 299300 LBS.

G-THERMOCOUPLE TO BE LEEDS & NORTHRUP - CAT. NO. 9060-1-E-2-20-1-0-1-208, SPRING LOADED (CHROMEL CONSTANTAN), STN ST. SHEATH, UNGROUNDED, ALUM. HEAD, .50 CONDUIT CONN.

H-PAINT ALL PARTS ONE COAT CARBO ZINC 12 (3 MILS) WITH SP-6 SURFACE PREP.(FS595)(KT). MASK BACK 1 IN. ALL FIELD WELDED JOINTS.

J-FOUR FANS ARE TO BE PROVIDED FOR EACH OF FOUR UNITS. OWNER TAG NUMBERS ARE AS FOLLOWS: XCCE-FAN-1A, XCCE-FAN-1B, XCCE-FAN-1C AND XCCE-FAN-1D, WHERE "X" IS THE ASSOCIATED UNIT NUMBER 1 OR 2.

K-ACTUATOR TO BE LINITORQUE SMCD/25/3400/HDCS, BORE TO SUIT 3.4375 [illegible] DIA. SHAFT WITH A .875 SQ. KEY ASSEMBLY POSITION "A" PER LINITORQUE DWG. 09-640-001-19

L-ROTOR REMOVAL INSTRUCTIONS
1. ADD TEMPORARY END PLATE (BY CUST.) TO FLOAT BRG END OF SHAFT
2. SLING BETWEEN OUTBOARD THRUST COLLAR AND COUPLING/TEMPORARY END PLATE. DO NOT SLING IN JOURNAL AREA.
3. USE NYLON SLINGS OR PROTECT SHAFT SURFACE FROM DAMAGE
4. MINIMUM VERTICAL LIFT REQ'D TO CLEAR BEARING THRUST COLLAR IS 9.50 IN.

RECEIVED FOR DISTRIBUTION
JUL 18 1984
BLACK & VEATCH

UNIT	FAN NO.	FAN ASSY. GROUP	THERMOCOUPLE TAG NO. INBOARD BRG.	THERMOCOUPLE TAG NO. OUTBOARD BRG.
1	1CCE-FAN-1A	002	1CCETXR-TE-0681	1CCETXX-TE-0685
	1CCE-FAN-1B	002	1CCETXR-TE-0682	1CCETXX-TE-0686
	1CCE-FAN-1C	001	1CCETXR-TE-0683	1CCETXR-TE-0687
	1CCE-FAN-1D	001	1CCETXR-TE-0684	1CCETXR-TE-0688
2	2CCE-FAN-1A	005	2CCETXR-TE-0681	2CCETXR-TE-0685
	2CCE-FAN-1B	005	2CCETXR-TE-0682	2CCETXR-TE-0686
	2CCE-FAN-1C	004	2CCETXR-TE-0683	2CCETXR-TE-0687
	2CCE-FAN-1D	004	2CCETXR-TE-0684	2CCETXR-TE-0688

CONSTRUCTION DRAWING
FURTHER CHANGES ARE SUBJECT TO EXTRA CHARGES

INTERMOUNTAIN POWER PROJECT
I.D. FANS UNITS 1 AND 2
PROJECT FILE 9255.62.3403

CUSTOMER PLEASE NOTE
1. FOR FOUNDATION DESIGN CRITERIA REFER TO DWG 2429D95
2. W.E.CORP FURNISHES ONLY THE PARTS CALLED FOR ON THE B/V ON THIS DWG
3. W.E.CORP DOES NOT FURNISH ANY CONCRETE FOUNDATION, FOUNDATION BOLTS OR SHIMS.
4. REFER TO POWER FAN INSTALLATION DESIGN GUIDE D.E. 90-100 AND INSTRUCTION BOOK 1.8 90-100 FOR INSTALLATION AND START-UP PROCEDURES.

WESTINGHOUSE ELECTRIC CORPORATION
TITLE (CONTRACT DRAWING 4132 SPECIAL I.D. FAN CL. 95" ARR. 9 DW W/32" BOXES 60° TAU DISCH. CW & CCW ROTA.
2090F87

Section 9.0 Inlet Dampers

GENERAL

Inlet Dampers are designed to be installed on the Inlet Flanges of the Fan Inlet Boxes, and to spin the air or gas stream in the direction of Wheel rotation when the Dampers are partially open, as indicated in Figure 9.0-1.

The Damper Shafts are offset in the Leafs so that the Leafs extend approximately 55% and 45% on either side of the Shaft centerline as shown in Figure 9.0-2.

When in the open position, the longer portion of the Leaf is toward the Fan, and the shorter portion is toward the duct or air entering side of the Damper. The Damper Leafs will extend beyond their channel frame when in the open position, and therefore extend into the Fan Inlet Box and the connecting duct work.

The Dampers are marked with a welded "X" or "Y" on the inside upper surface of the channel flange to be assembled to the Inlet Box flange, with the corresponding welded "X" or "Y" as shown in Figure 9.0-3.

"X" indicates clockwise air spin rotation, and "Y" counterclockwise, when viewed from the specific inlet - NOT the Fan rotation designation. These are NOT alignment match marks, and need not be in line.

SWSI Fans have only one (1) Inlet Damper, and therefore the Drive Shaft extends beyond the Damper

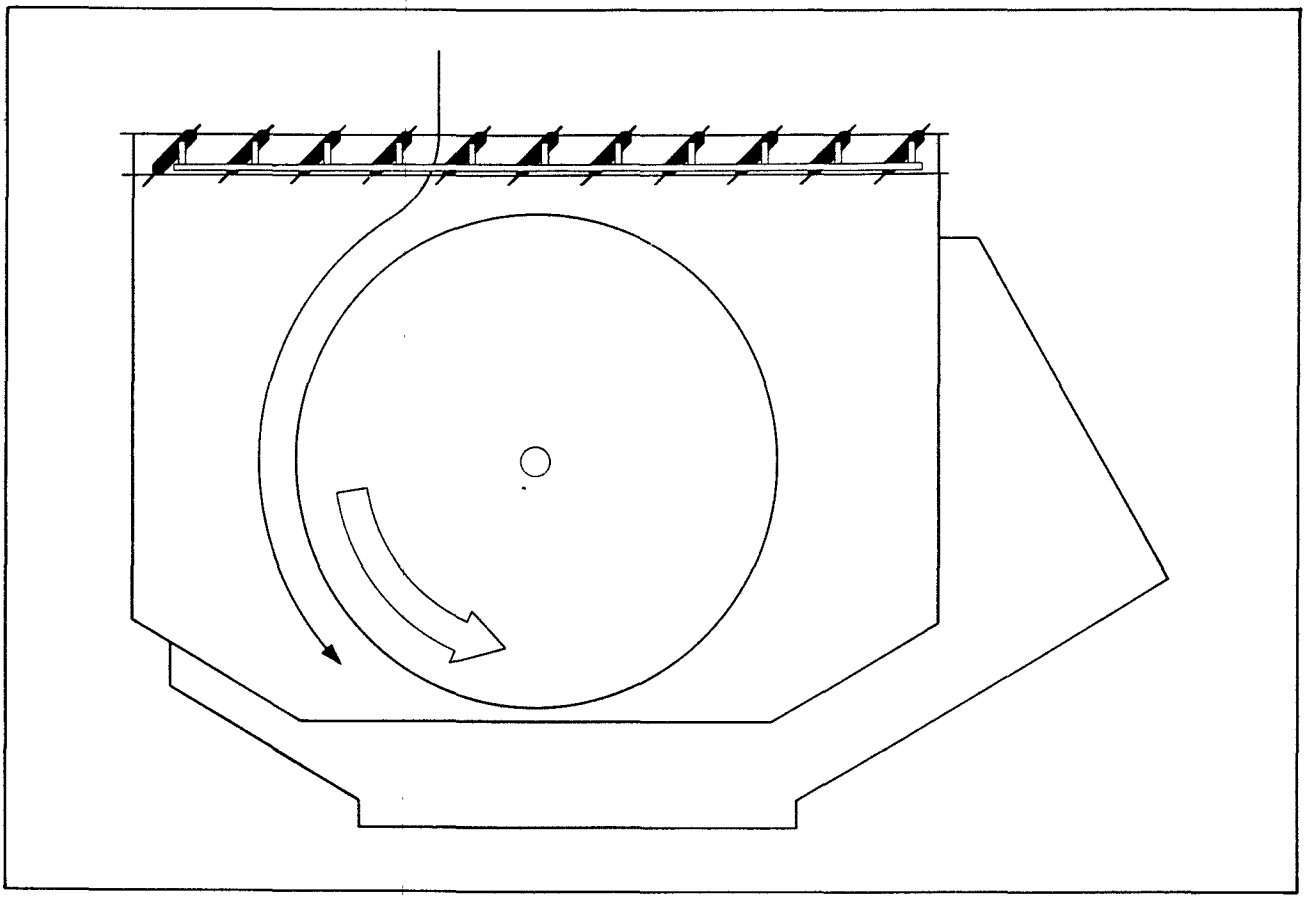


Fig. 9.0-1 *Inlet Damper Orientation*

Effective January 1978

Westinghouse Electric Corporation
Sturtevant Division
Hyde Park, Boston, MA 02136

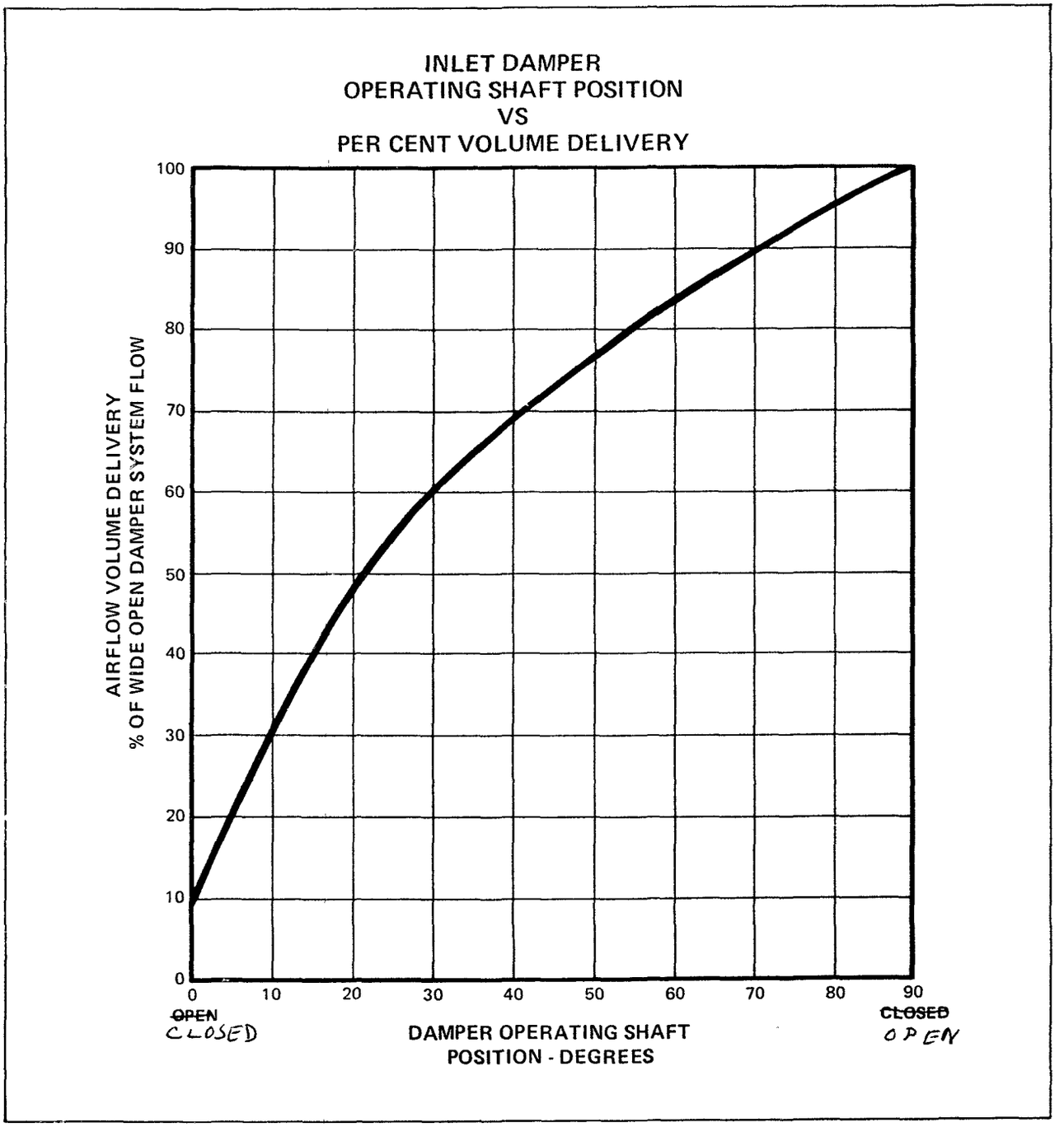


Fig. 9.1-3 *Inlet Damper Flow Curve*

See Solution on next page

COST/BENEFIT ANALYSIS

CASE STUDY

You are a Senior Systems Analyst leading the feasibility phase for analysing a purchasing/order processing/inventory control system for Twentieth Century Frox. A system has been proposed which appears to meet the users' needs. There is no real "system" in place today. The expected life of the proposed system is three years. Twentieth Century Frox projects a 15% company growth compounded annually.

Your mandate is to produce a cost/benefit analysis of the proposed system and to provide recommendations to the senior management of Twentieth Century Frox.

Here are some other facts to aid you in reaching a solution.

- Another project team, responsible for systems development, has provided their initial estimates:
  $230,000.00
  6 months

- Upon investigation you find this team experienced an average 85-100% cost/time overrun on the their last three projects. However, the quality of the end product is generally high. Development is scheduled to begin in two months.

- The proposed system is purported to have the following benefits:

  A. Overtime (currently $150,000 per year) would be reduced by 10%.
  B. Inventory carrying costs would be reduced by $250,000.
  C. Profit on investment from inventory reduction would be $125,000.
  D. Anticipated profit on the reduction ot lost sales is $32,000 based on sales and order desk statistics.
  E. Estimated operating cost of the new system (including hardware rental and software licensing) is $14,000 a year.